

A NEW GENUS OF WATER MOLD RELATED TO
BLASTOCLADIA

BY W. C. COKER AND F. A. GRANT

PLATE 32

Septocladia n. genus.

Plant small, slender, the short or long stalk not conspicuously differentiated; branches usually dichotomous, often verticillate in groups of 3-5, separated from the nodes by distinct and complete septa, not constricted at intervals; in vigorous cultures repeating the branching in the same way to form a complex plant. Sporangia oval, terminal, sympodially arranged, not rarely in chains of several, often clustered by the shortening of the branches, which continue the stem by one or more lateral buds beneath. Spores biciliate at times, but the two cilia so closely approximated or fused as usually to appear as one. Resting bodies (unfertilized eggs), borne in the same way as the sporangia and of the same size and shape, at maturity enclosed in a thin, hyaline sheath out of which they finally fall through an apical slit; the wall brown and conspicuously pitted as in *Blastocladia*: the whole probably representing a thin-walled oögonium completely filled with a thick-walled parthenogenetic egg.

A saprophytic aquatic of anomalous structure and differing from all other Phycomycetes in the regular and normal septation of the plant body. To be placed in the Family *Blastocladaceae*.

Septocladia dichotoma n. sp.

Characters of the genus. Threads extending about 3 mm. from the substratum on a termite ant, about $10-73\mu$ thick, growing gradually more slender distally at each joint, basal joints $35-130\mu$ long, those of central region up to about 675μ long; tips blunt, hyaline. Sporangia oval, $28-46 \times 55-76\mu$; spores escaping singly through one or two usually apical holes or short papillae, biciliate (or uniciliate by fusion of the two cilia?) oval when swimming with the cilia apical, monoplanetic, amoeboid before encysting 10μ thick when at rest; sprouting by a slender thread. Resting bodies appearing later than the sporangia but of the same shape, $25-39.2 \times 36.3-49.2\mu$, the conspicuous pits apparently sunken from the outside in regular fashion as in *Blastocladia Pringsheimii*, at maturity slipping from the thin, clasping sheath; their sprouting not observed.

Found only once, October 20, 1921, on a knuckle bone of beef partly covered with water, in Sparrow's pasture, Chapel Hill, N. C. (F. A. Grant col.).

There is no doubt of the close relationship of this plant to *Blastocladia* of which four species are now known, and which was made the type of a new family, *Blastocladiaceae*, by Minden (Crypt. Flora, Mark Brand. 5: 506. 1912). The four known species of *Blastocladia* are as follows:

Blastocladia Pringsheimii Reinseh (Jahrb. f. Wiss. Bot. 11:291. 1876). Sporangia much elongated, resting bodies with thick and pitted wall, not slipping from a sheath at maturity; sterile, slender filaments often present among the reproductive bodies.

Blastocladia rostrata Minden (l. c., p. 604). Much like *B. Pringsheimii*, but resting bodies slipping from sheath at maturity.

Blastocladia ramosa Thaxter (Bot. Gaz. 21:50. 1896). Sporangia shorter; resting bodies with thin and scarcely pitted wall; sterile filaments absent.

Blastocladia prolifera Minden (l. c. p. 606). Much like *B. ramosa*, but sporangia proliferating internally, as in *Saprolegnia*: the only species with this habit. Resting bodies slipping from a sheath at maturity.

In the form of the sporangia and resting cells and in the absence of sterile filaments among them our plant resembles most closely *B. ramosa* and *B. prolifera*. The remarkable resting bodies with their thick brown, strongly pitted walls and peculiar habit of slipping at maturity from the closely fitting sheath are so strikingly similar in structure and habit to those of *B. rostrata* and *B. prolifera* and in structure to those of *B. Pringsheimii* that one is immediately convinced of their close relationship. The diagnosis of the family will have to be extended to include septate as well as non-septate forms.

On an agar plate the plant does not do well. A few root-like threads grow out, branched and with cross-walls in the older portions, and in these older portions are found resting bodies or sporangia, sometimes fifteen or twenty of the latter may be in a row. The reproductive bodies are sometimes found in clusters or single on short lateral stalks.

On boiled corn grain the growth is good. The threads are about the same size as on an ant but average longer, as much as 5 mm. The protoplasm in threads is not as dense as when grown on ant.

Threads at substratum as large as 102μ in diameter. Sporangia are produced better than on ants, and resting bodies are so abundant that with the unaided eye they give a brick dust color to the entire

culture. The resting bodies are at first dark and have numerous large oil droplets. As they get older the walls assume a yellowish-brown color and the contents become homogeneous. They appear singly along the branches in sympodial arrangement.

In a discharging sporangium a few spores that failed to get out were observed to crawl about actively in an amoeboid fashion for a good while. After an hour they had encysted and one had sprouted.

The spores are of a peculiar internal structure, resembling closely those of *B. Pringsheimii* as shown by Thaxter (l. c. pl. 3, fig. 11). Most of the protoplasm is at the end opposite the cilia, the center is almost clear and the cilia seem to extend down through the clear tip to a protoplasmic mass below, as shown in our fig. 5.

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EXPLANATION OF PLATE 32

Septocladia dichotoma

- Fig. 1. Empty sporangia in chains. x 154.
 Fig. 2. Three sporangia, one discharging spores, two empty. x 420.
 Fig. 3. Vegetative branch, showing short joints and young resting bodies. x 59.
 Fig. 4. Optical section of resting body and empty sporangium with two apertures. x 420.
 Fig. 5. Two spores showing cilia. x 1296.
 Fig. 6. Spores showing amoeboid movement before encysting. x 810.
 Fig. 7. Sprouting spores. x 1008.
 Fig. 8. Habit sketch, showing empty sporangia and resting bodies. x 96.
 Fig. 9. Vegetative tips, showing refractive bodies and clear blunt tips. x 150.
 Fig. 10. Optical section of mature resting body with empty sporangium below. x 420.
 Fig. 11. Long, slender thread on corn grain, showing sympodial arrangement of resting bodies. x 96.
 Fig. 12. Surface view of resting body, showing pits. x 420.
 Fig. 13. Part of branch, showing thin sheath out of which the resting body (Fig. 12) has slipped. x 420.
 Fig. 14. Section of thick wall of the resting body, showing the pits and the sheath outside. x 1296.
 Fig. 15. Mature sporangium just before discharge of spores. x 420.
 Fig. 16. Group showing some sporangia before maturity and some after emptying. x 96.